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BEE-KEEPING

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BEE-KEEPING

Apiculture is a science as well as an art of rearing honey-bees for producing honey and wax on the one hand and to help cross pollination in crops on the other. "The bee helps the garden, the garden helps the bee, and the man reaps the harvest of both."

Bee-keeping has been known in India for a long time past. It was carried out in the hills as well as in the South, though in a crude way. The bee colonies were heavily smoked, bees killed, and combs destroyed, and only then the honey obtained. This practice was responsible for a large scale destruction of the honey bee population, and reduction in the production of honey and wax.

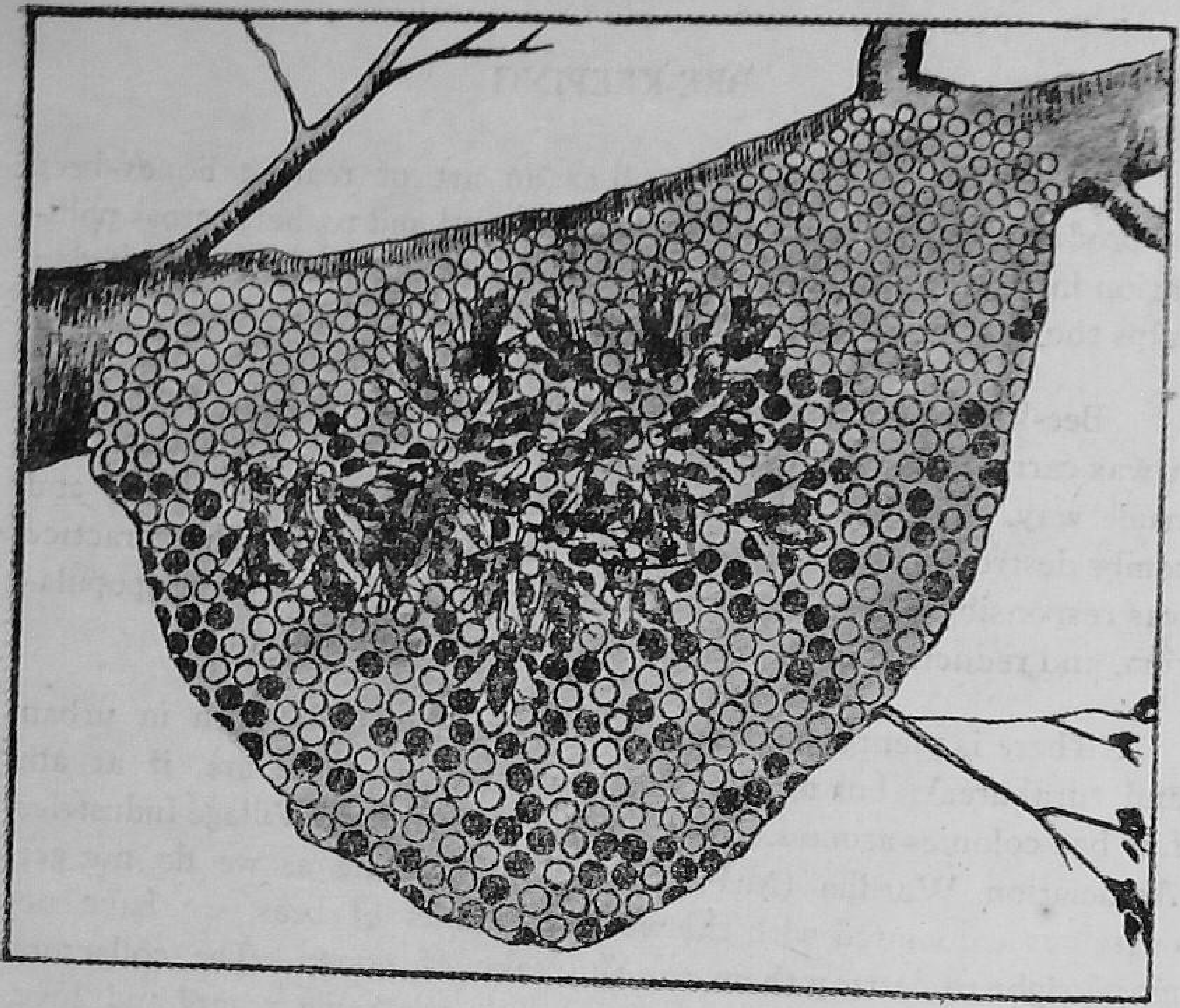
There is plenty of pollen and nectar available both in urban and rural areas, but most of them go waste, as there are, if at all, few bee colonies around. Kumarappa of the All India Village Industries Association Wardha (M.P.) has said, "So long as we do not get ourselves acquainted with the ways and habits of bees, we have no moral right to destroy them for the sake of honey. The collectors of honey should look upon the bees with the same regard and love as the shepherd or a cowboy bestows on his herd."

There are four species of honey bees commonly found in India. These are apis Dorsata (Rock bee), Apis Indica, (Indian bee), Apis Florea (Little bee) and Melliponasp. The first two are important from the point of view of honey production.

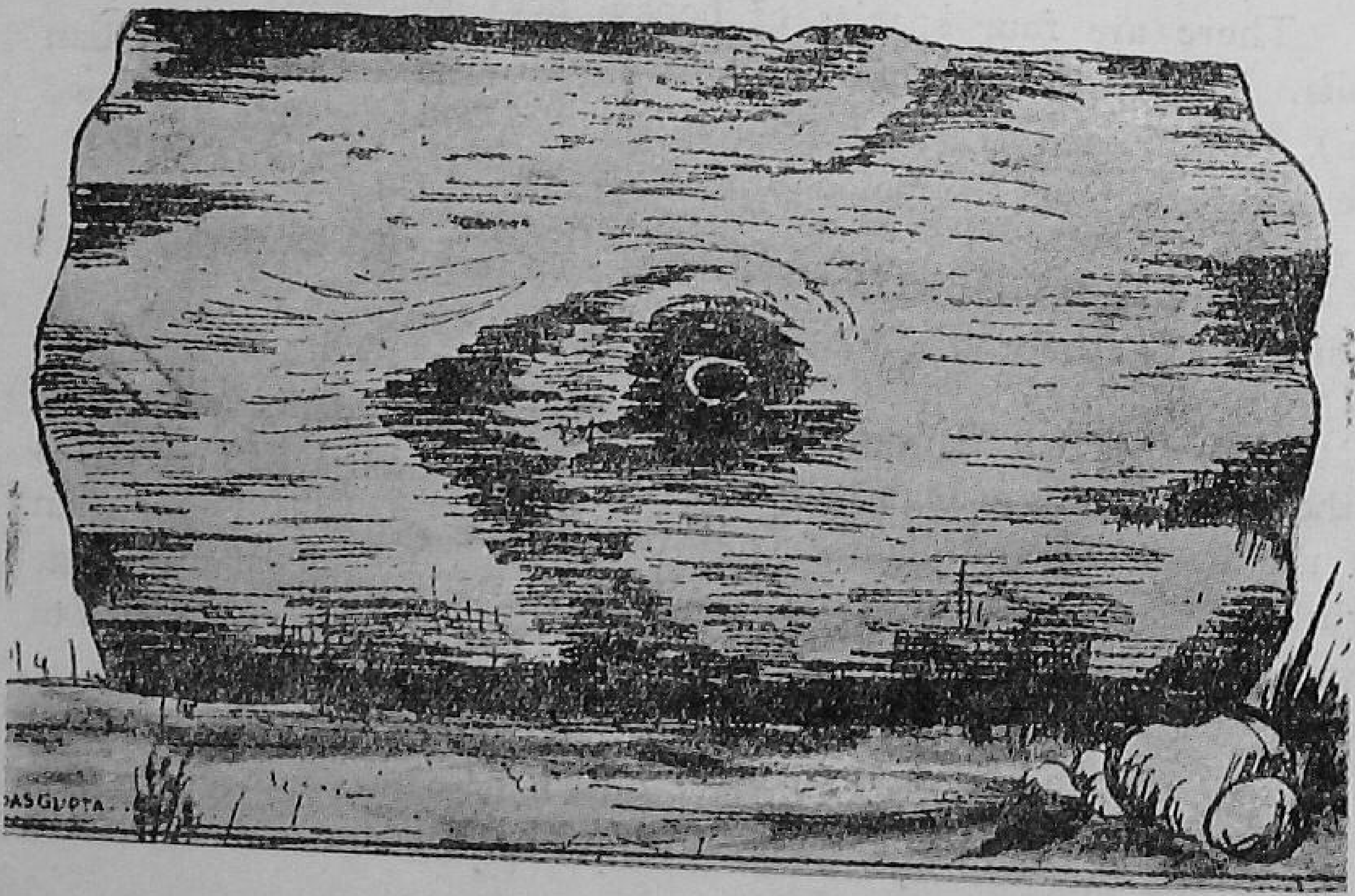
In India, the Apis Dorsata is known as '*Sarang*', the Apis Indica as '*Khaira*' and the Apis Florea as '*Bhunga*'.

Apis Dorsata (Sarang) is wild in nature. Its combs are found either on the roofs of high buildings or on the branches of high trees in the open air and light. The size of this comb is larger than others. These bees are very ferocious in nature and take revenge from one who destroys or crushes their comb. The production of honey by Apis Dorsata is by far the largest.

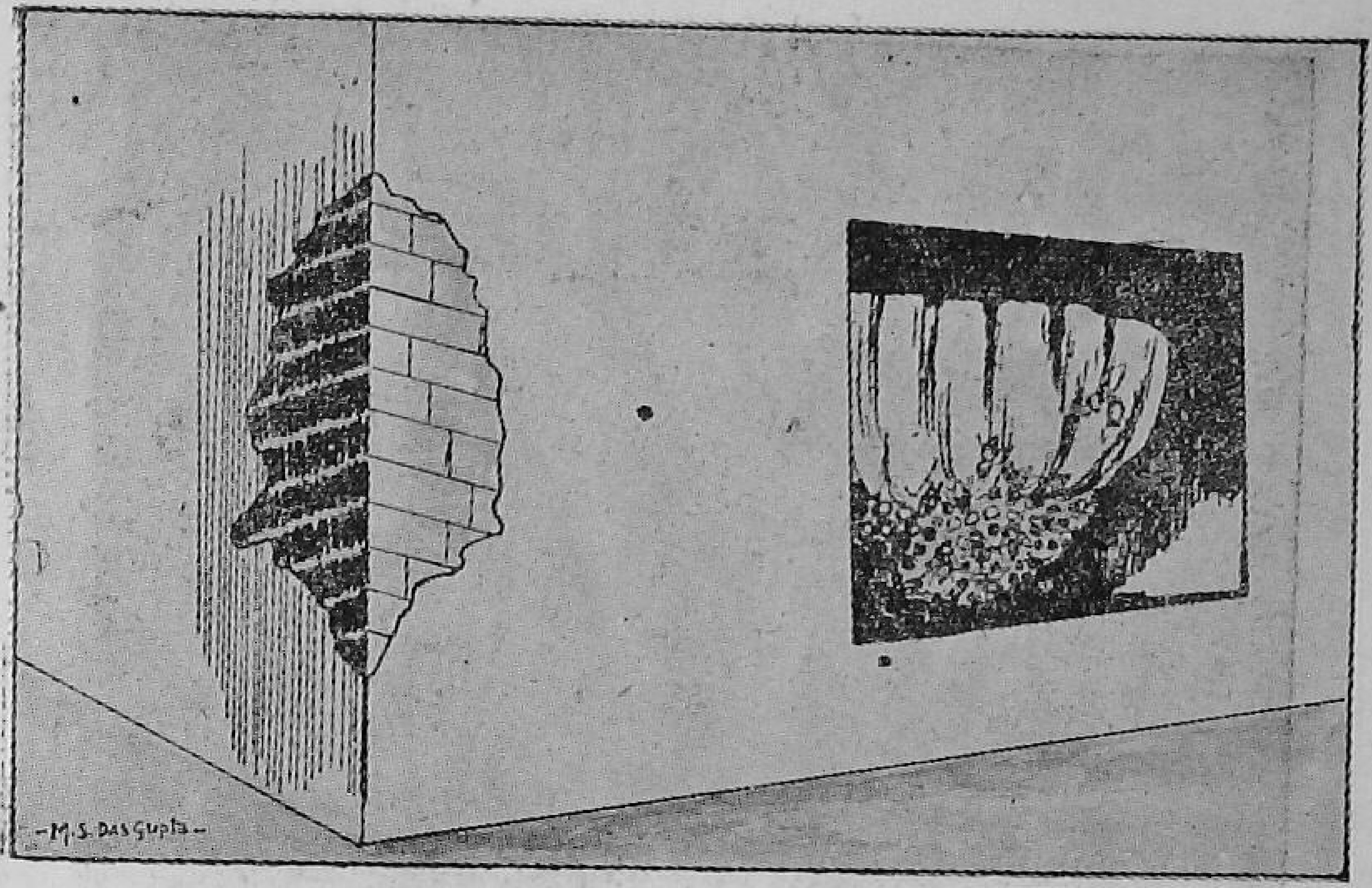
Apis Florea (Bhunga) also makes its combs in the open air and light mostly in the bushes, hedges etc. ; but the production of honey in its case is very little.



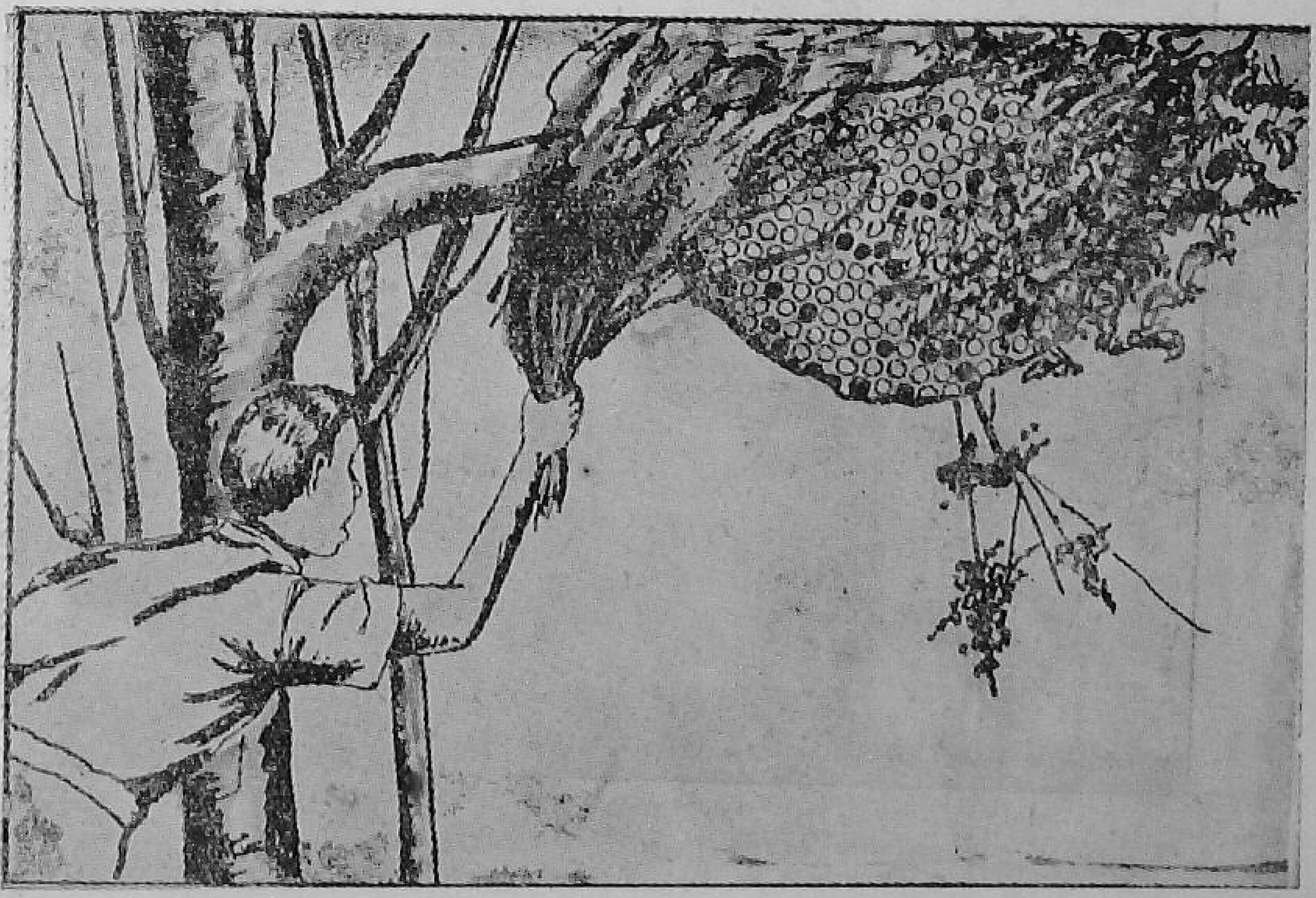
Comb of Apis Dorsata



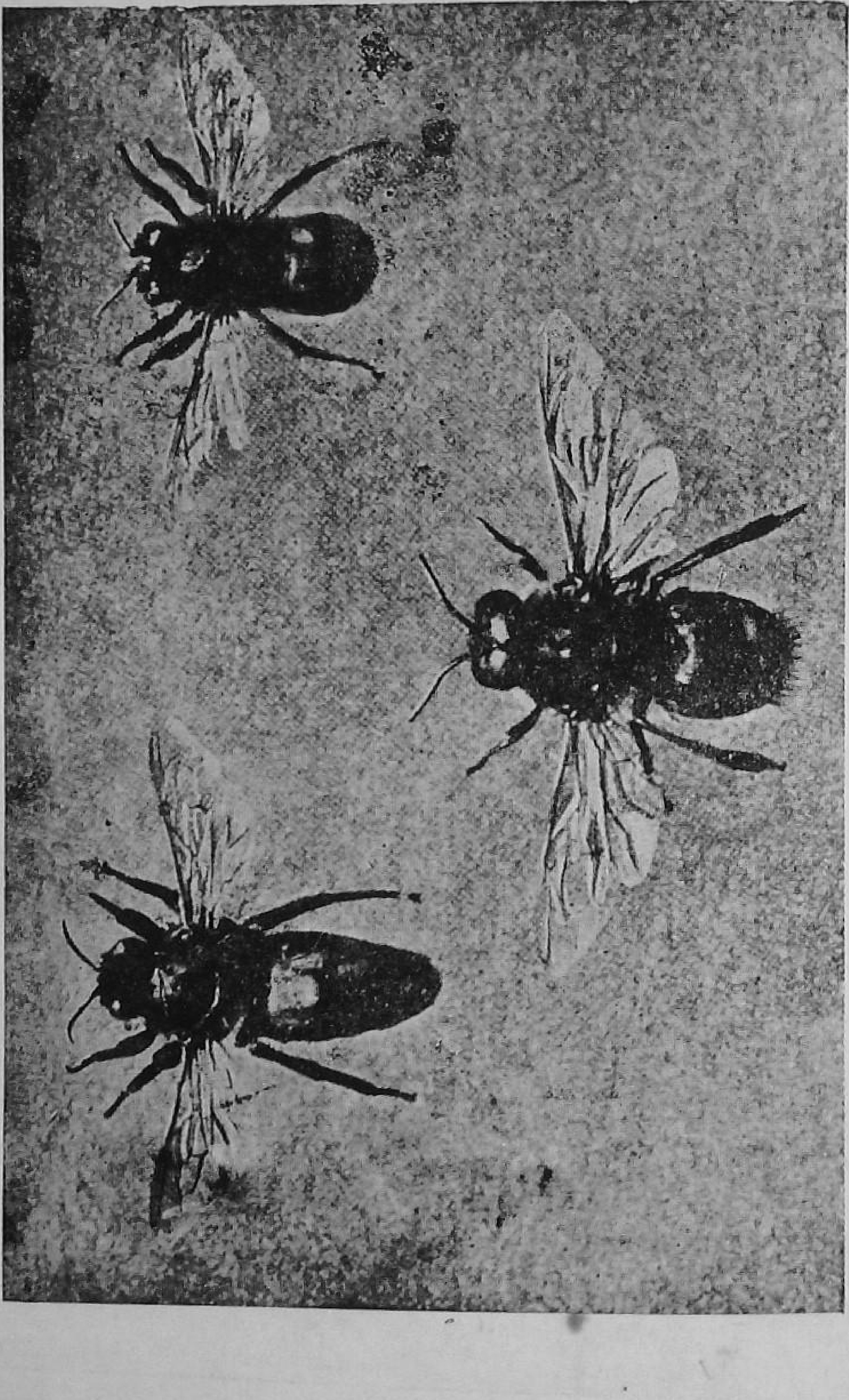
Bee-hive in a hollow log



Bee-hive in the wall



Using smoke to keep off the bees for honey extraction



Left—Queen-bee Centre—Drone-bee Right—Worker-bee

Apis Indica (Khaira) does not live in the open. It makes its combs in dark, cool and shady places in holes or cracks in the walls, rocks or in the hollows in the trunks of the trees. It is the only species of honey bee which can be domesticated. These bees do not make one single comb but several combs attached in the hive parallel to each other. By habit they stick to a place for several years unless disturbed or destroyed. Their existence in a place can easily by located by their frequent coming out and going in the hive. There are some nomad tribes known as 'Kanjar' who roam about in forests and other deserted places in search of game and honey and are the right people to give information of their existence in a locality.

The bee-hive consists of a queen, a few drones, and a large number of workers.

The queen-bee has the largest abdomen as compared to other bees in the hive and is the mother of the colony. She is the only full-grown female. She is fertilized once and spends her whole life of 2 to 3 years in laying eggs. There is no special cell in the comb for her to live in, and she lives like any other occupant of the hive.

A new queen is also raised when the old queen becomes infertile or the workers desire a swarm with the queen to leave the hive, or the queen is dead.

The drones are the males of the colony. They have no sting and live on the food gathered by the workers. Only one drone fertilizes the queen and then dies. When the honey flow season is over, the drones are no longer required, so the workers suddenly attack and kill them.

The worker-bees which are really under-developed females, make combs, provide the colony with food, attend to cleaning, guard the hive, and nurse the young bees.

Organisation in the colony

In a normal colony, the queen is a prolific with a good laying capacity, with worker-bees to look after the various activities in the hive. The bigger the number of worker-bees, the greater will be the success of the colony. The drones are essential, as without them the queen will not be fertilized and though they are idle, they cannot be eliminated.

Where bee-keeping can be done ?

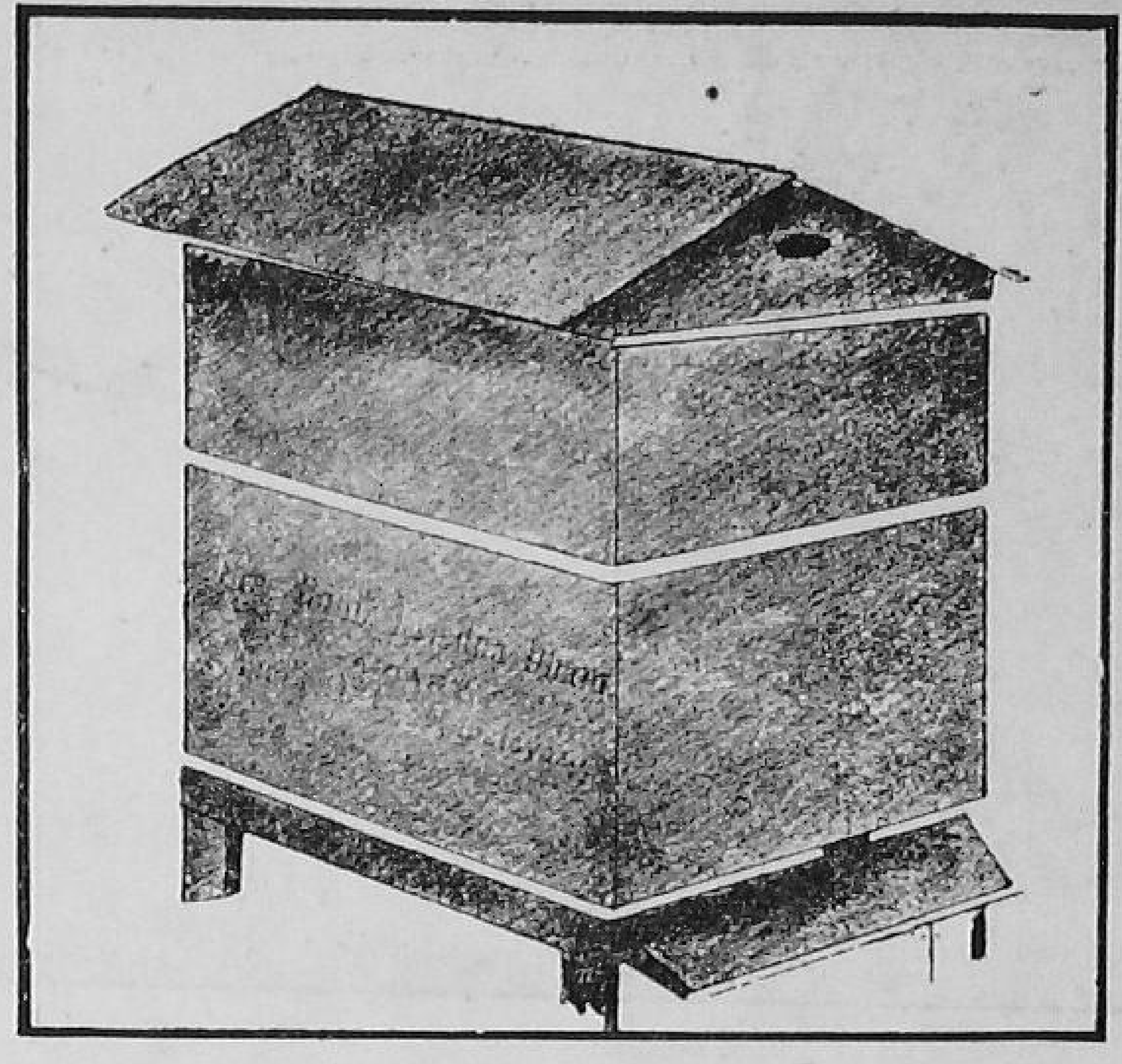
It has been a general impression with many that bees can be domesticated only in gardens where flowers are in abundance. But this is not correct. Bees in nature can even be found in deserted wild areas and not necessarily in gardens full of flowers. It is actually the pollen and nectar with which they are concerned. The plants in which cross-pollination takes place are mostly the ones with which the bees make friends. In fact, nature has provided an affinity between such plants and the honey bees. When the bees go out in search of pollen, they go from flower to flower, and while doing so distribute the pollen of one flower to other flowers. They do not want only pollen for the young bees, but also nectar, which is secreted at the base of flower, for older bees. So such visits of the honey-bees help in cross-pollination resulting higher production. It is, therefore in the interest of the farmer to keep bees on his farm and orchard.

Bee-keeping equipment

There is not much equipment which is actually required to domesticate honey bees and start bee-keeping. A simple wooden bee-hive can easily be manufactured locally; or can be obtained from any recognised apiary on payment for about Rs. 20/- or a little more. The hive consists of two chambers, placed one over the other, having a closed roof. These chambers are provided with frames (hangers) for fixing the combs. The lowest chamber is larger in capacity and size than others and is known as brood chamber. The upper chamber is known as super. In addition, a smoker, a pair of gloves, a net veil, a bee-catching net, a wire gauze frame, a knife, a brush and a honey extractor are required.

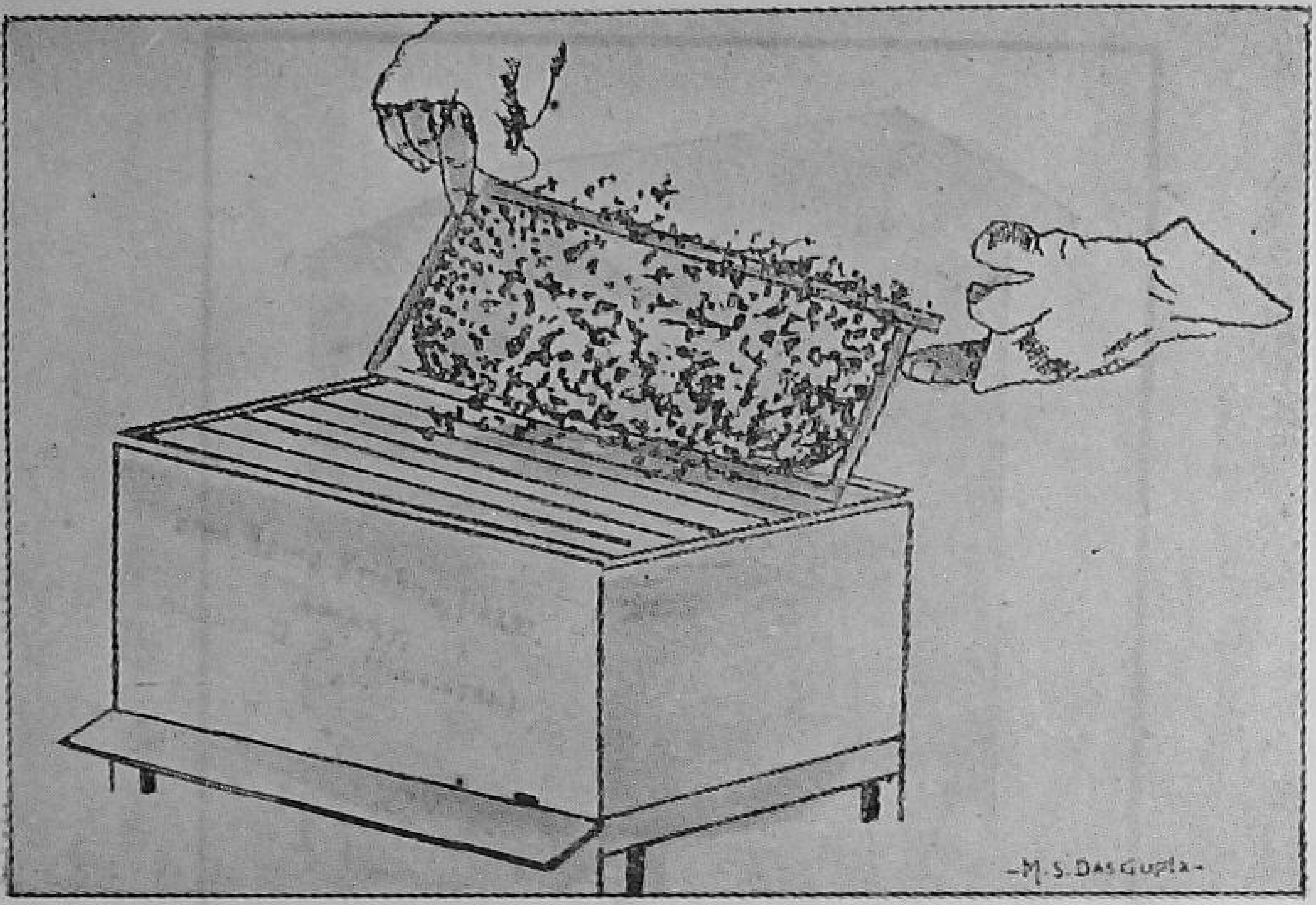
How to start ?

The first act to do is to locate a colony in nature either in a hollow of a tree or in the crack of a wall. When found, one has to reach there, and then to broaden the opening of the hive, by gently and slowly cutting it open. By doing so, the bees will feel uncomfortable and will come out to surround the person cutting the hive open. But they will not sting. One should not get nervous and, if necessary, can use the net veil. When the comb is visible from the opening, the knife should be used to cut the comb from the top, one

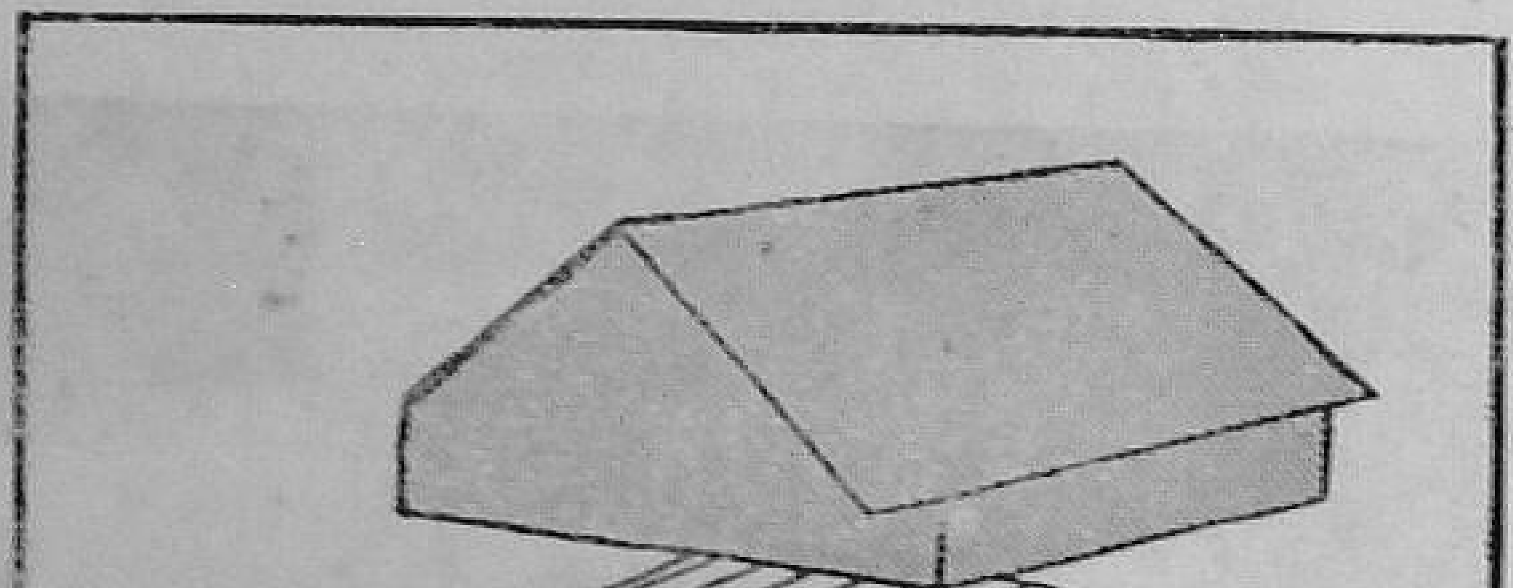


Hive

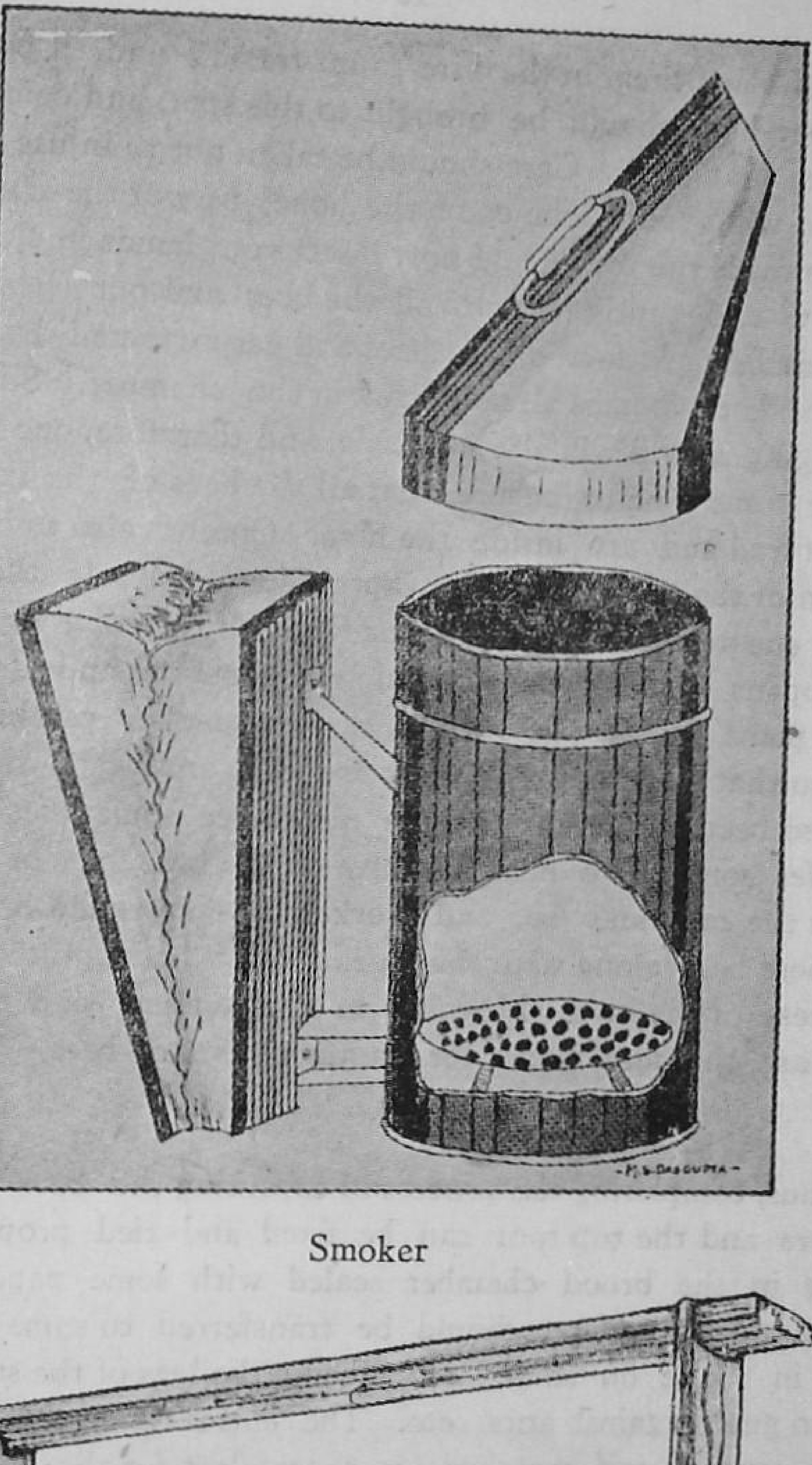
Showing use of honey extractor



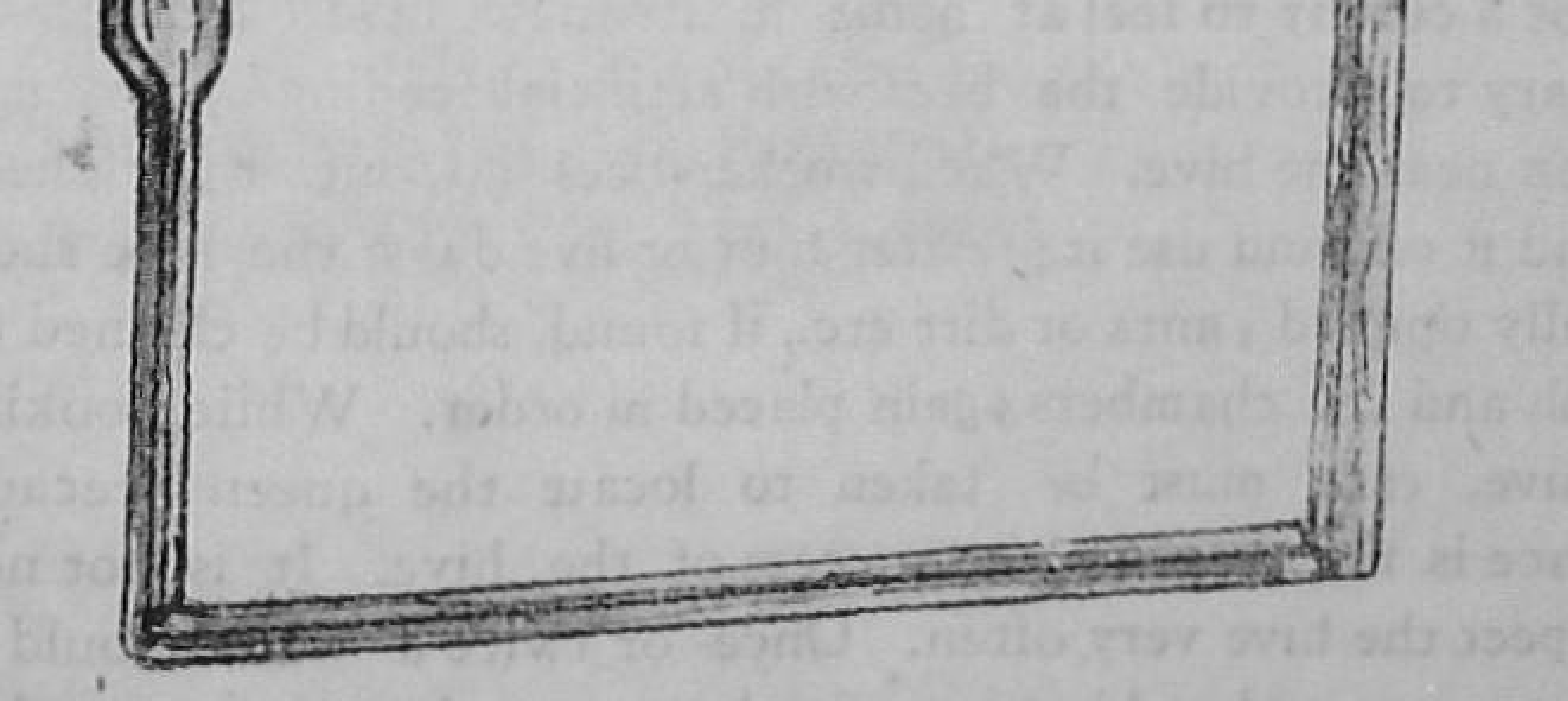
Handling one bee-frame



Parts of the hive



Smoker

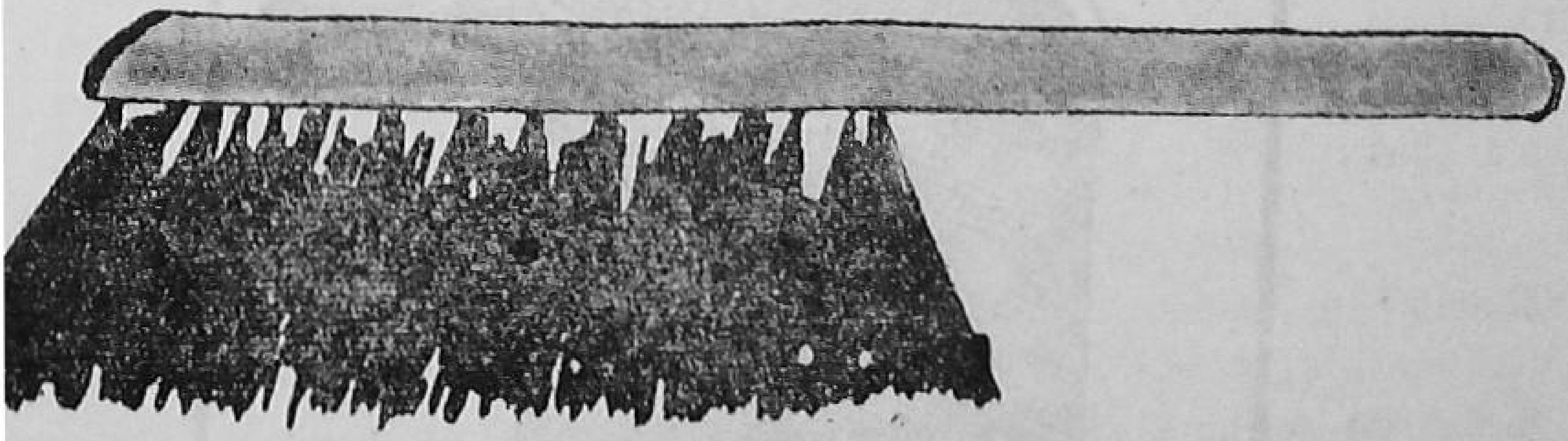


Frame

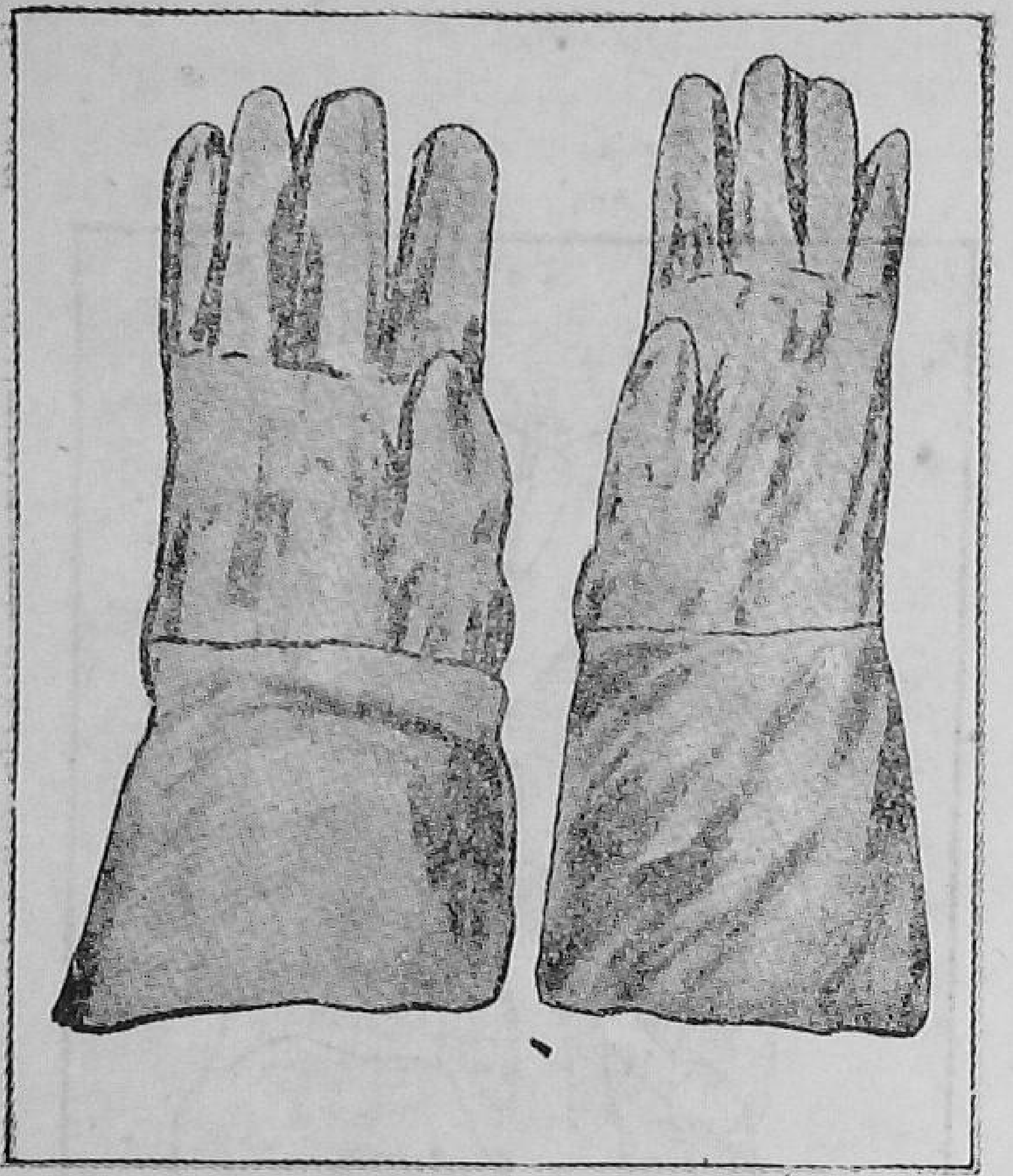
by one, and place them in the wire-gauze frame ; and, if possible, the wooden bee-hive should be brought to this spot, and combs fixed in the frames (hangers). Care should be taken not to injure any of the comb, and while fixing the comb the honey part of the comb should be kept towards the top. And now insert your hands in gloves inside the hollow and gently capture all the bees and put them over the brood chamber. In fact, all the bees will get attracted by the smell and go inside the combs already fixed in the chamber. Some of the bees hanging round will also go inside, and therefore, one has to wait for quite some time to ensure that all the bees of the colony have been captured and are inside the hive. One has also to be sure that the queen of the colony has been captured and is inside the chamber. This will ensure coming in of all the bees of the colony. Sometimes it so happens that all the bees do not come out and remain in the original place (hive). In such a case, a smoker can be used, very gently, so that all the bees may come out and reach the new hive. It has also been observed that the queen-bee sometimes comes out and settles somewhere near the hive on the branches of the trees or walls, as the case may be, and worker-bees surround her. In such cases, these bees along with the queen must be captured to ensure the success of the hive. Morning in the summer and noon in the winter are the ideal times for capturing honey-bees.

Thus, completing the process of capturing the bees, all the three chambers and the top roof can be fixed and tied properly and the opening in the brood chamber sealed with some paper etc. The bee-hive, now complete, should be transferred to some garden, and placed in shade on some stool, placing the legs of the stool in water bowls to guard against ants, etc. The entrance of the hive should now be opened and watched for a few days for the going out and coming in of the bees in the hive. Generally it takes three to four days for a colony to feel at home in its new hive. Sometimes, it is necessary to provide the bees with artificial feeding by placing sugar solution near the hive. When worker-bees go out, they themselves can find it out and use it. After four or five days, the hive should be carefully opened ; ants or dirt etc., if found, should be cleaned through a brush and the chambers again placed in order. While looking into the hive, care must be taken to locate the queen because her presence is the key to the success of the hive. It is not necessary to inspect the hive very often. Once or twice a week should do. In the same way, other hives can also be arranged to start an apiary.

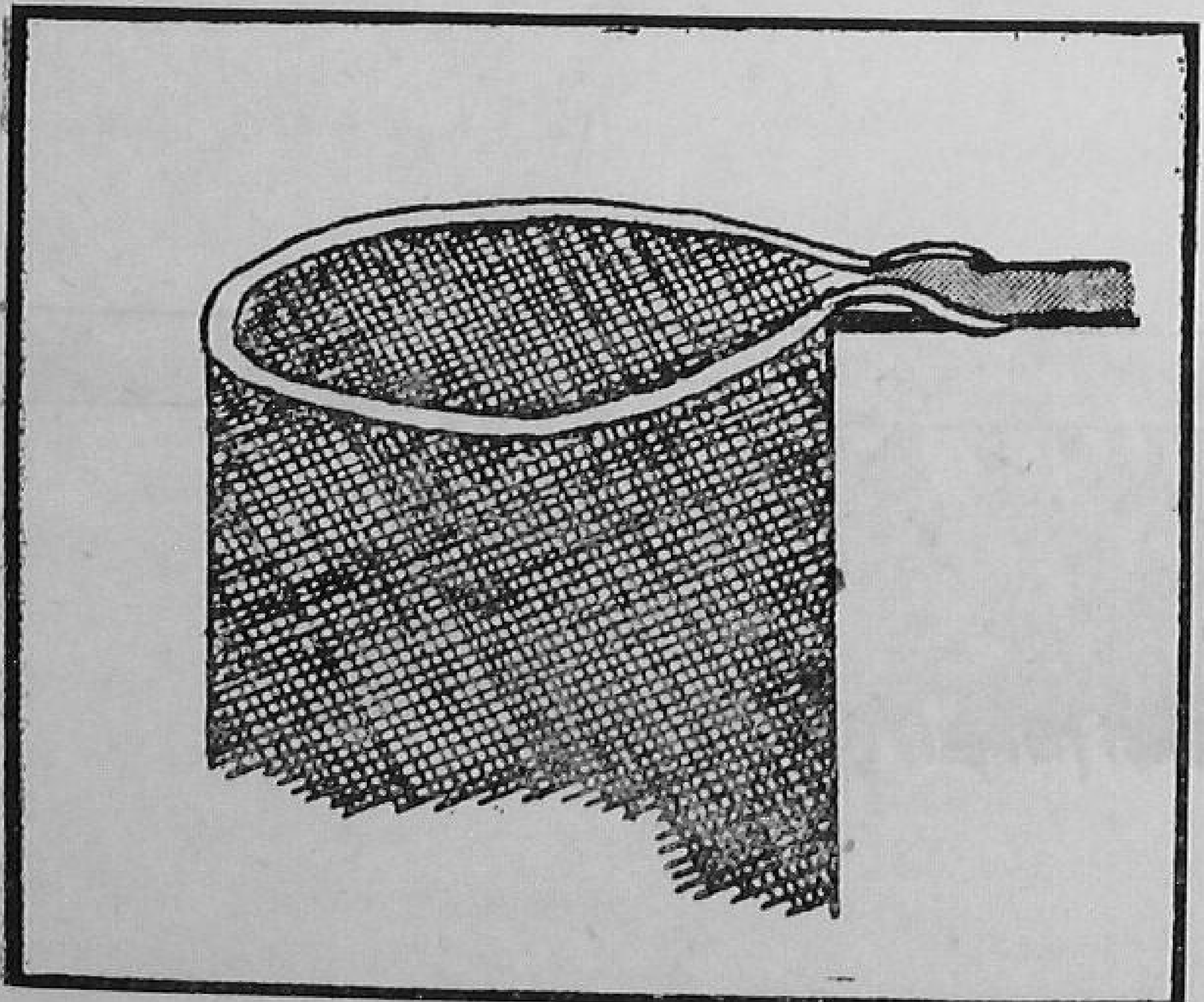
Bee-veil



Bee-brush



Gloves



Swarm-catching net

Bee colonies are also available for sale from recognised apiaries and can be had on payment from Shri Ramakrishna Dham Apiary ; Almora ; U.P. Bee-keepers' Association, B.N. Verma Road, Lucknow, Bee-Keeping Station, Jeolikot District Nanital ; and All India Village Industries Association, Maganvadi, Wardha (C.P.). It is difficult to transport bee colonies and, therefore, careful handling is extremely essential during the transit to ensure the succsess of the colony.

Swarming

It is a natural phase in the life of honey bees. They leave the hive to establish a new home elsewhere. Such migration of the bees is known as swarming. It happens when the hive has more population of bees than it can reasonably accommodate. When swarming phase comes, some of the bees become sluggish, their activity lessens and one can see the lack of coming in and going out of the bees from the hive. This is a clear indication that the colony is preparing for swarming. Generally it takes place during the day and when it occurs, bees rush out of the hives and circle round in the open, and finally settle down somewhere either on walls or branches of the trees, and after some time try to find a new place for establishing their new home. A keen bee-keeper actually awaits the coming of swarming season for making additions to his bee colonies. Such swarms should, therefore, be located and captured for establishing new hives.

How to extract honey ?

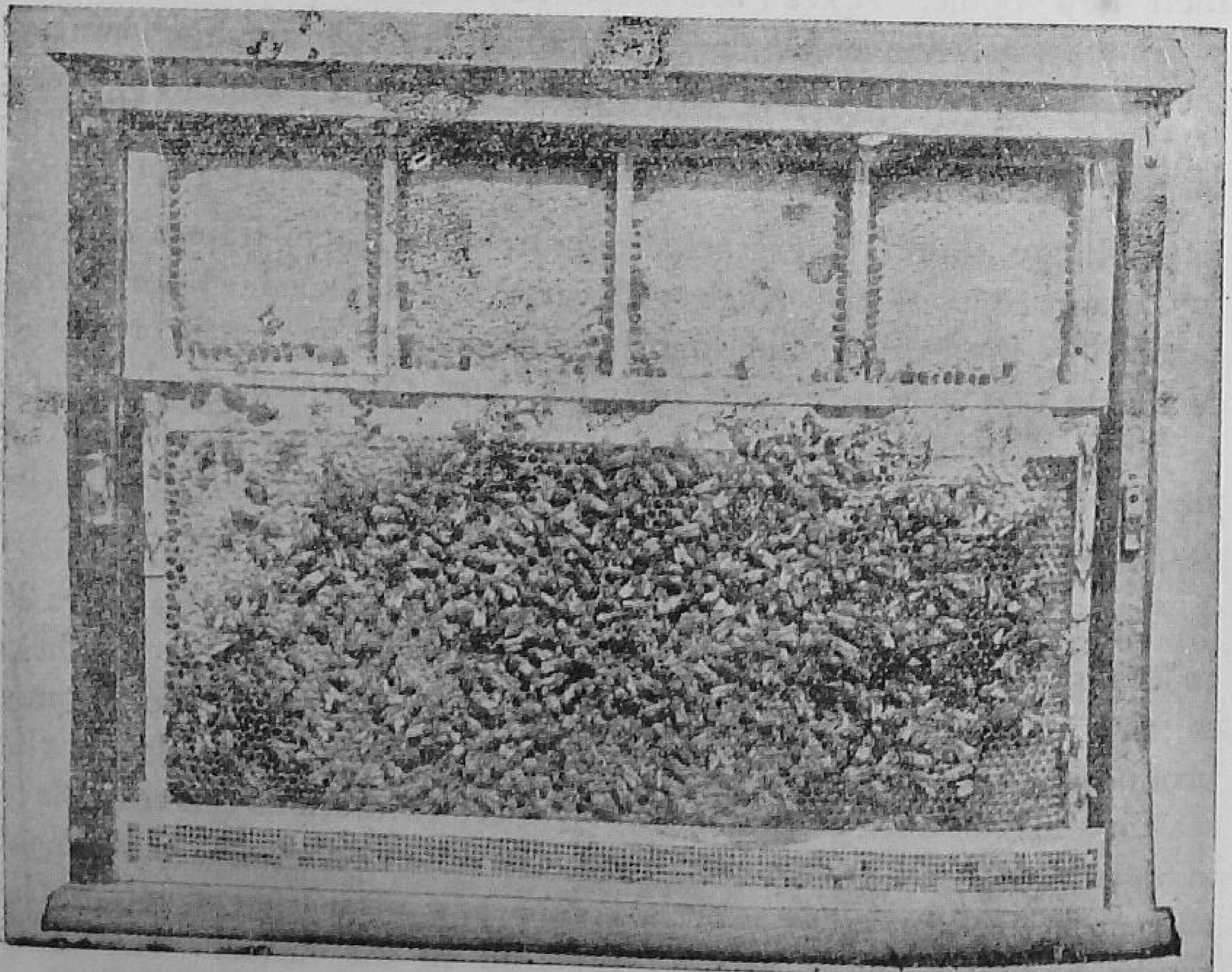
Honey should be extracted only from the super-frames when 75 to 80 per cent of the comb cells are found sealed. Prior to the extraction, the bees surrounding the combs should be gently removed or brushed off. After driving away the bees, the sealed comb should be opened in-door with a knife. The knife, before use, should be sterilized. The honey comb should now be placed inside the extractor for extracting the honey.

In a normal season, a normal hive, on an average, can give 20 to 25 lbs. of honey per year, in addition to wax ; and the bees help in the cross-pollination of crops around. The amount of honey produced and the speed at which it is produced depends on the season and the flora around. Two or three extractions can take place in a normal year. The extraction of honey through centrifugal extractor need not destroy the combs and after the extraction, the combs fixed in frames can be replaced in the hives. The only change the bees can find will be the loss of honey but not of home.

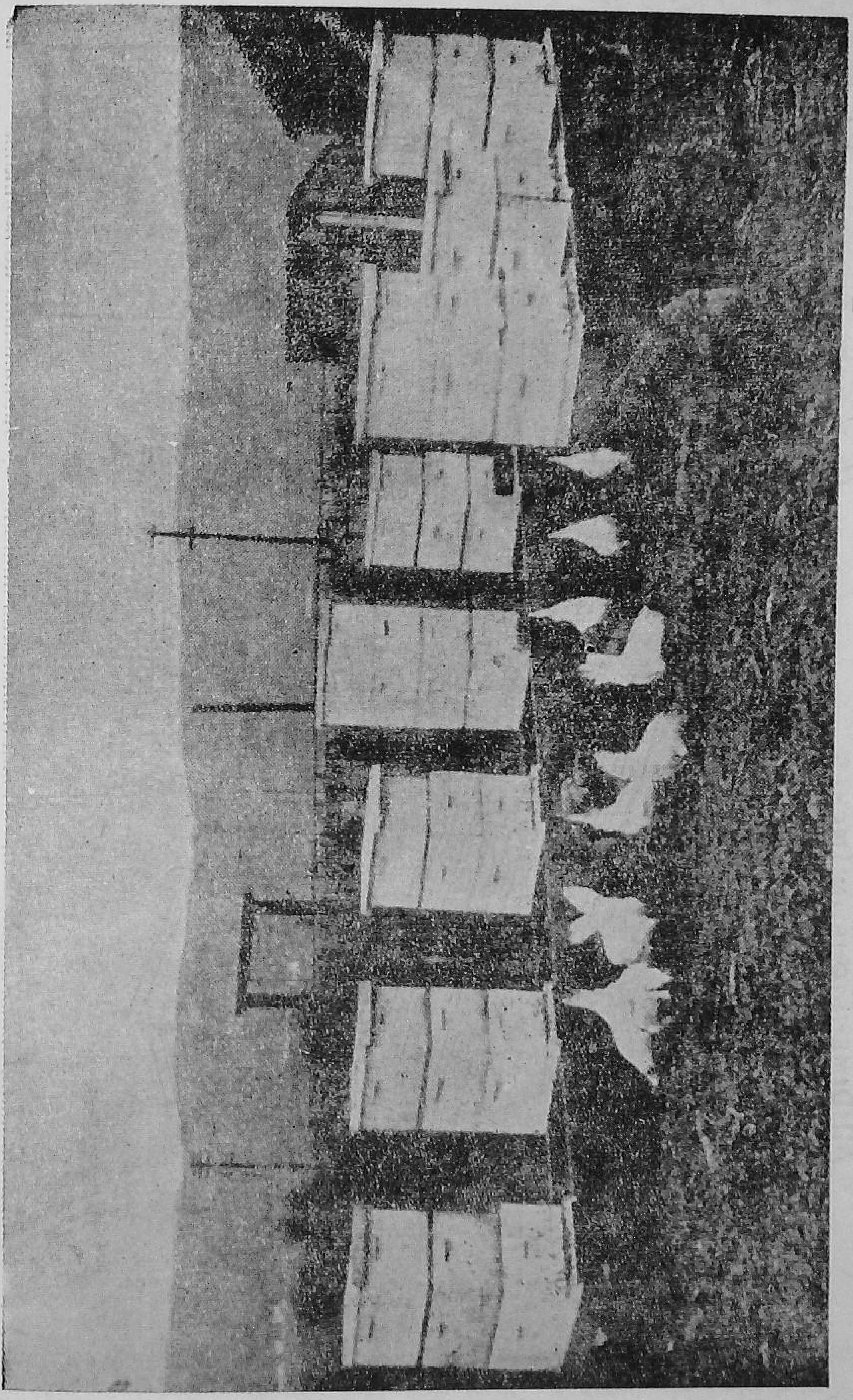
Possibilities of development

There are two possibilities of developing bee-keeping in our Community Projects and N.E.S. areas and these can easily be taken up after training the staff and the farmers for a short period. The first is the domestication of *Apis Indica (Khaira)* by keeping them in improved bee-hives in the fields and orchards of the farmers to increase the production of honey and wax and also to facilitate pollination. This subsidiary industry, allied to agriculture, will not only provide employment to the farmer's family but also give a monetary return to supplement his income.

The second possibility is to organise extraction of honey hygienically from the combs of *Apis Dorsata*. The production of honey in their case is pretty large, and, at present, most of it is done through crude methods resulting in unhygienic honey being sold in the market, and destruction of population of honey-bees. The action called for in this case is to locate areas where *Apis Dorsata* combs are found and to organise co-operatives who should take contracts for the extraction of honey. These co-operatives should be supplied with improved honey extractors, so that the honey thus obtained is brought to the market pure and hygienic, and the destruction to bees population is stopped. Proper curing, bottling and marketing should also be done by the co-operatives.

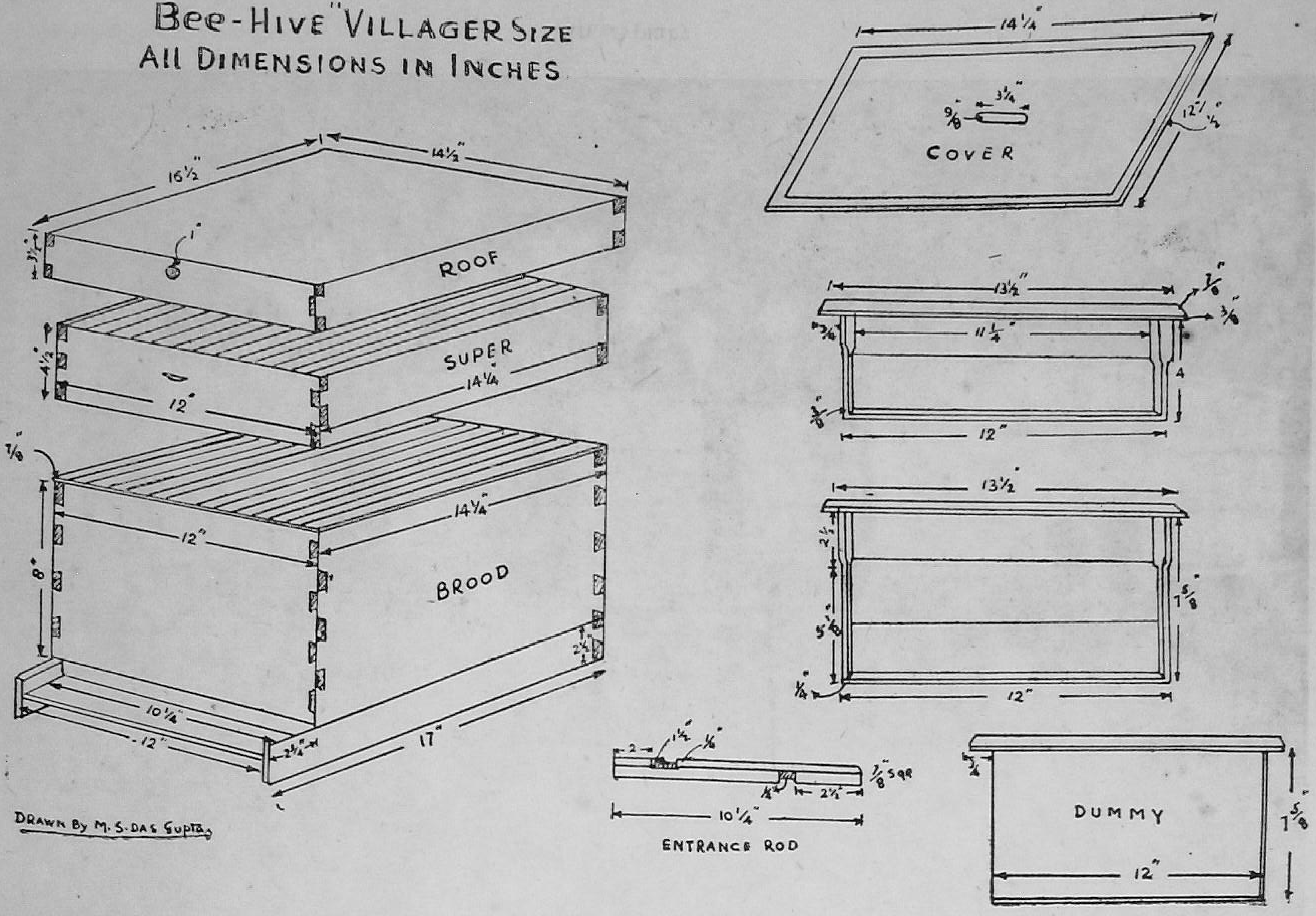


Observation hive



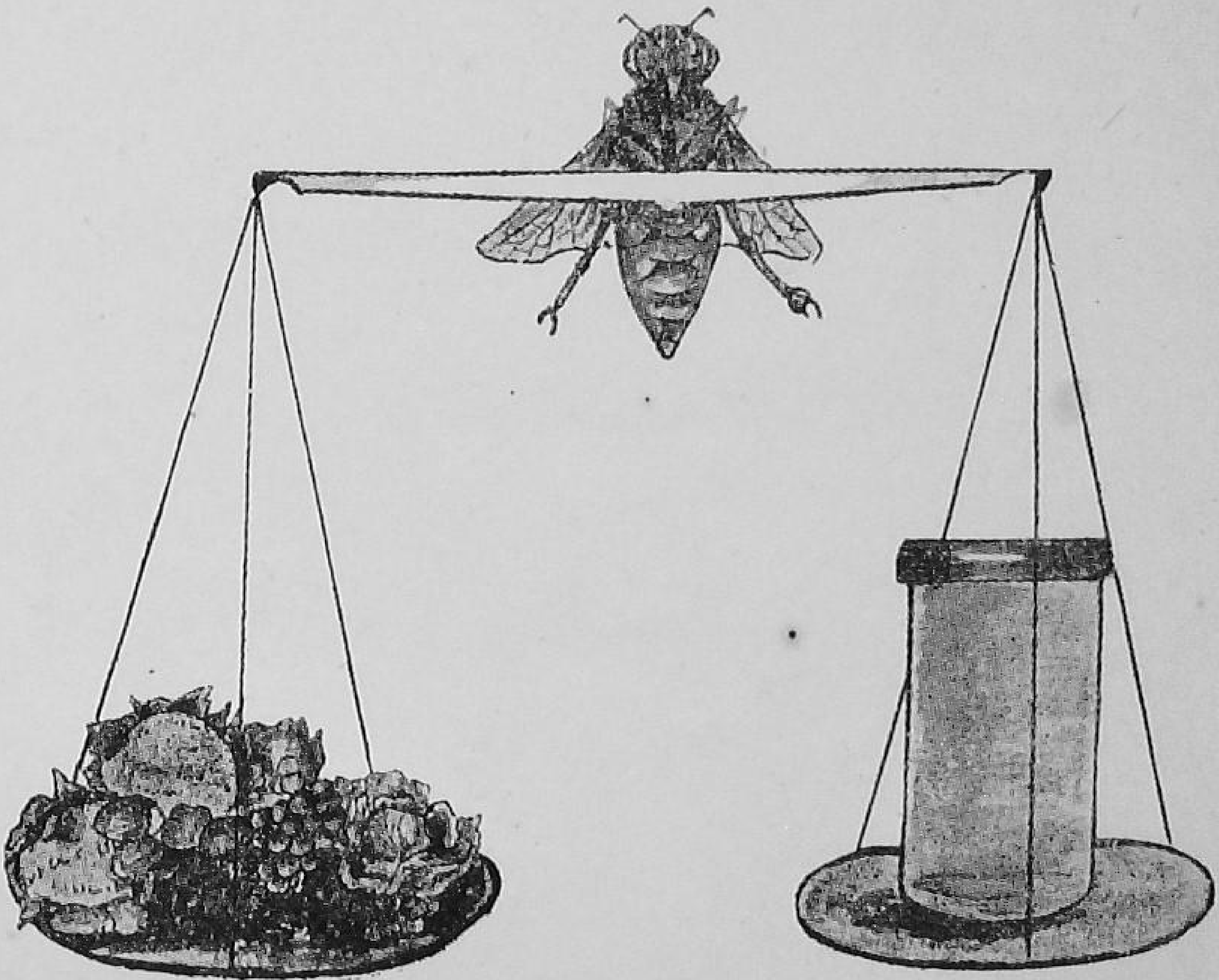
An Apiary

Bee-Hive "Villager Size
All Dimensions in Inches



ONE POUND OF HONEY IS EQUAL IN FOOD-VALUE TO—

Lbs.	Ozs.	Food	(ADDITIONALLY)	
4	5	Grapes	Thiamina	
3	8	Potatoes	(Vitamine BI) ...	36-5UG
3	—	Bananas	Riboflavin	
13	—	Cauliflower	(Vitamine G) ...	268UG
13	—	Cabbage	Ascorbic Acid	
7	8	Pears	(Vitamine C) ...	18MG
5	—	Apples	Pantothenic Acid ...	254UG
7	—	Peaches	Nicotinic Acid ...	0.60MG



HERE IS WHAT A POUND OF HONEY IS COMPOSED OF—

Levulose (Fruit Sugar)	6½ oz.
Dextrose (Glucose)	5½ oz.
Sucrose	9 gm.
Moisture	3 oz.
Dextrines and Gums	7 gm.
Iron, Calcium, Sonium Phosphorus, etc. ...	1 gm.

Besides the above, honey contains from 2½% to 4% of undermined matter or unknown substances, difficult to demonstrate quantitatively.

A POUND OF HONEY WILL DO YOU MORE GOOD THAN A POUND OF ANY OTHER FOOD